Allowing 2 kg 50 for impressing velocity upon the air, the formula $d = (v_t^2$ -r-20)At can be transposed, as follows:

For the case in hand, <5 = 2 kg 50

A*=0.239

20=19.62

and v = 14 m 325 per second (47.00 ft per second)

The air and gas velocities have to be corrected by a coefficient, according to their relative masses and volumes. These coefficients are derived as follows:

5.32X1.125 = 5.9855 = 0.3523 for gas
8.51X1.293~11.003~0.6477 for air

Therefore, the value of the air component will be

14.325X0.6477 = 9.28.

The area of the air-port will be

45.99-^-14.325 = 3 m^2 21 = 34.55 sq ft.

Considerable latitude may be allowed in proportioning the gas- and air-port velocities and angles, to obtain the necessary resultant angle and velocity. Theoretically, the entire velocity may be supplied by either the gas or the air, or it may be divided between them. The ports may both be given the resultant angle, or the port angles may differ, provided the angular velocity components of the air and the gas give the angle and velocity necessary for the resultant. In practice there are certain structural limitations in regard to the location of the ports. These limits must be considered. In this case it will be assumed that the port angles are the same, being the resultant angle. The resultant velocity is 20 m 00 (65.62 ft) per second. Under these conditions the velocity component for the gas will be

20.00-9.28 = 10.72;

from which the gas-port velocity will be

10.72 •*- 0.3523 = 30 m 43 per second (99.84 ft per second).